CHANGING WHAT'S POSSIBLE

ARPA-E Update

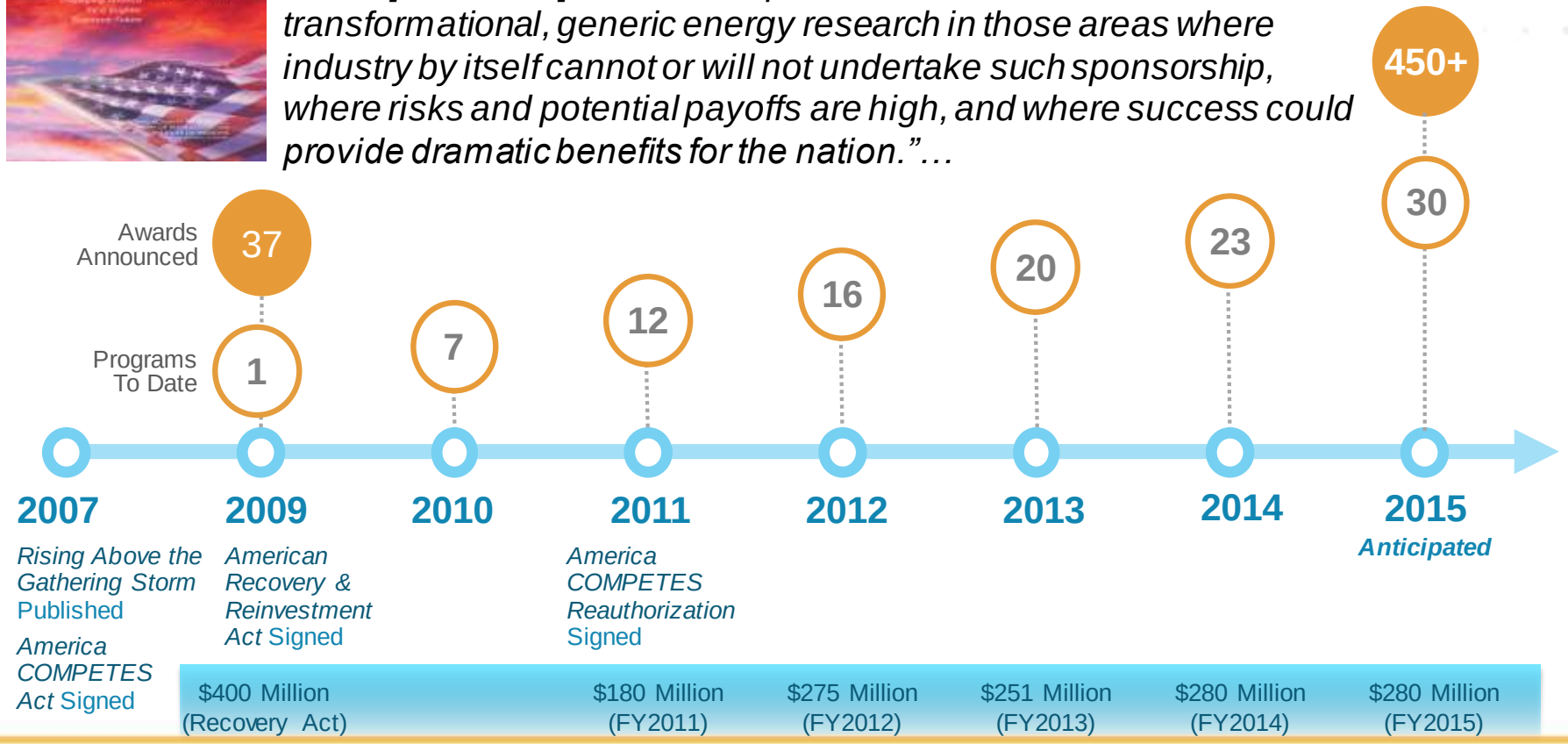
Eric Rohlfing, Deputy Director for Technology

ALPHA Kickoff Meeting
Santa Fe, NM
October 14, 2015

ARPA-E's History

In 2007, The National Academies recommended Congress establish an Advanced Research Projects Agency within the U.S. Department of Energy

…"The new agency proposed herein [ARPA-E] is patterned after that model [of DARPA] and would sponsor creative, out-of-the-box, transformational, generic energy research in those areas where industry by itself cannot or will not undertake such sponsorship, where risks and potential payoffs are high, and where success could provide dramatic benefits for the nation."…



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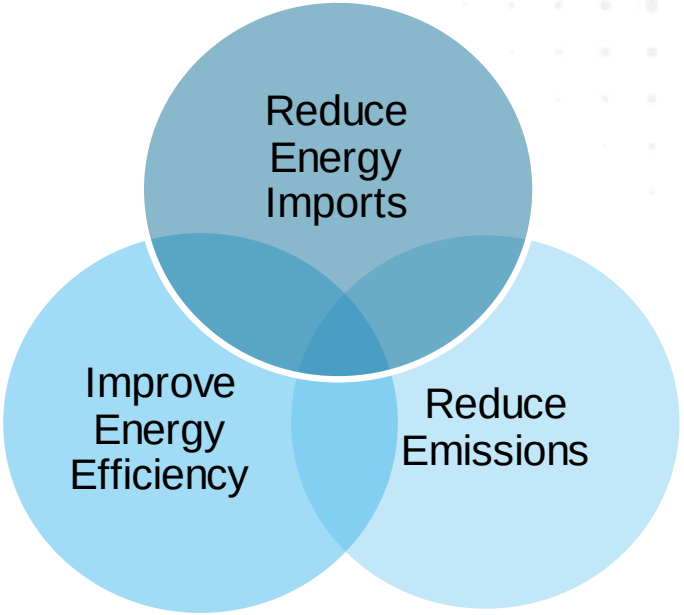
ARPA-E Authorizing Legislation

Mission: To overcome long-term and high-risk technological barriers in the development of energy technologies

Goals: **Ensure America's**

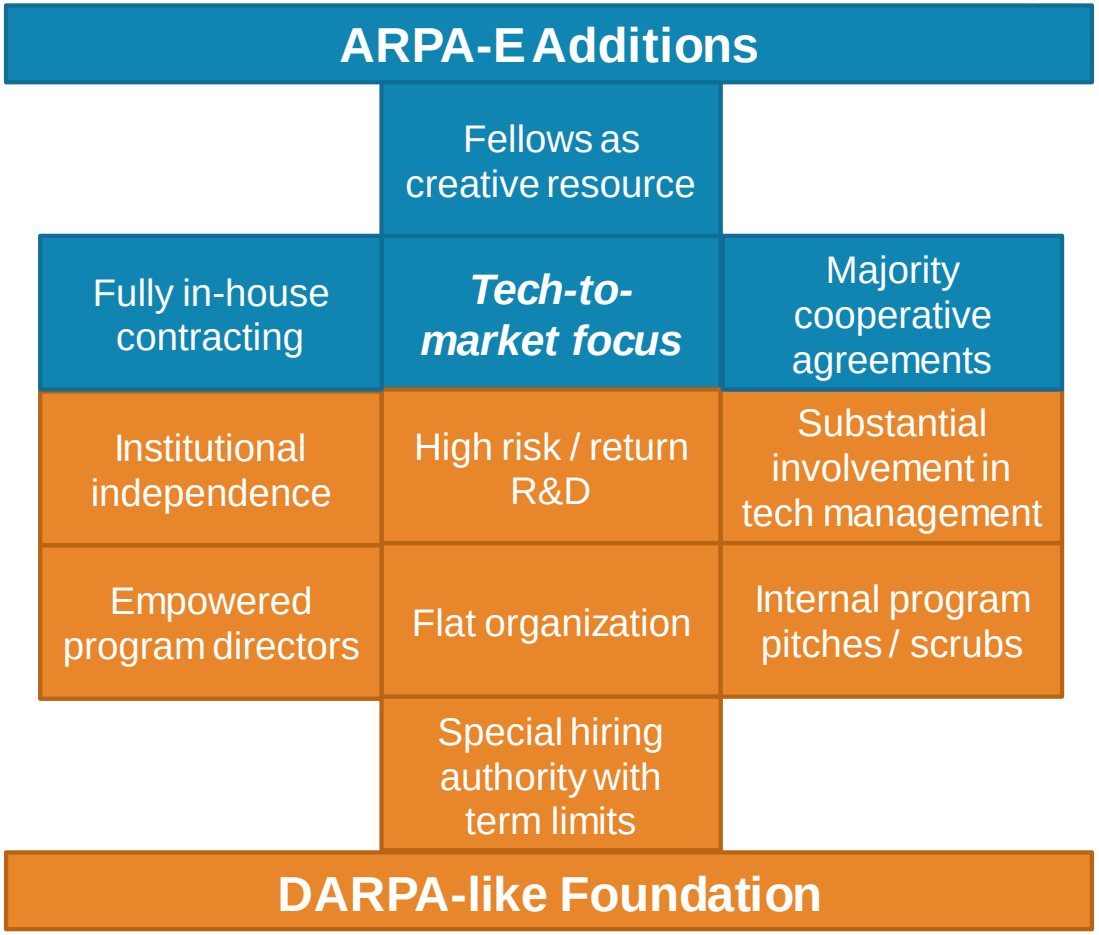
- Economic Security
- Energy Security
- Technological Lead in Advanced Energy Technologies



Means:

- Identify and promote revolutionary advances in fundamental and applied sciences
- Translate scientific discoveries and cutting-edge inventions into technological innovations
- Accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty

Built on DARPA foundation, but still evolving…



Unique to DARPA:

Staged prototype demonstrations	Large-scale systems integration	Primary "customer" (DoD)

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Programs

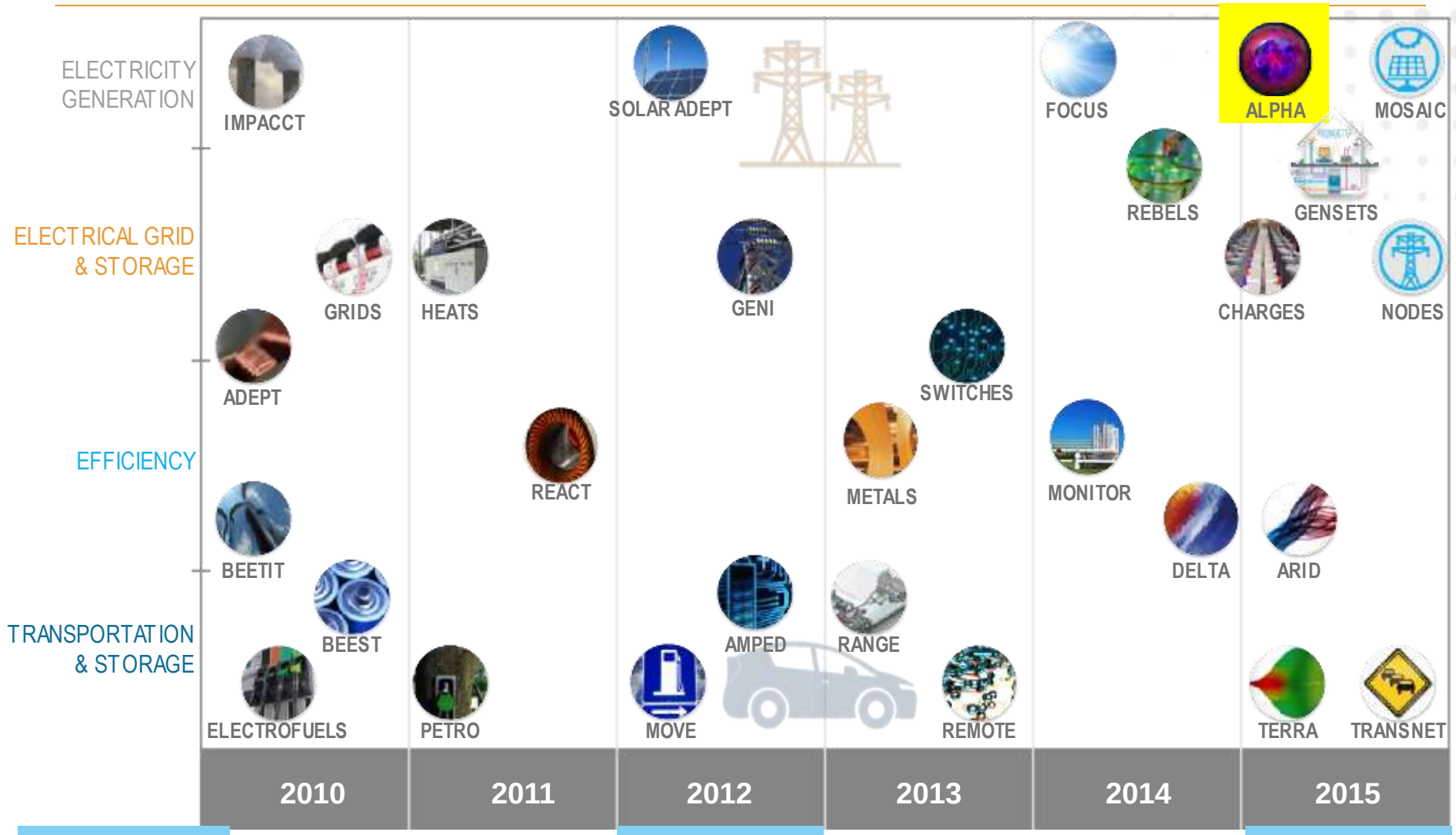
OPEN programs support the development of potentially disruptive new technologies across the full spectrum of energy applications.

- Complement focused programs
- Support innovative “one off” projects
- Provide a “snapshot” of energy R&D

Focused programs prioritize R&D topics by their potential to make a significant difference in ARPA-E’s mission space.

- Size of the potential impact
- Technical opportunities for transformation
- Portfolio of projects with different approaches

The ARPA-E Portfolio



OPEN 2009
36 projects

OPEN 2012
66 projects

OPEN 2015
?? projects

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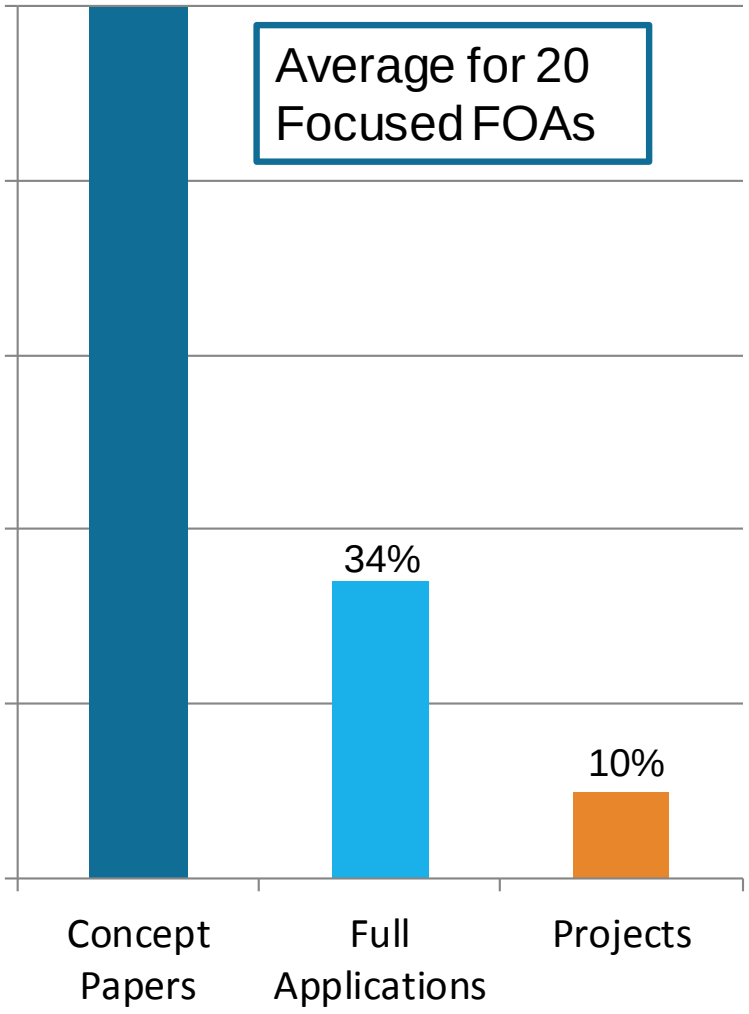
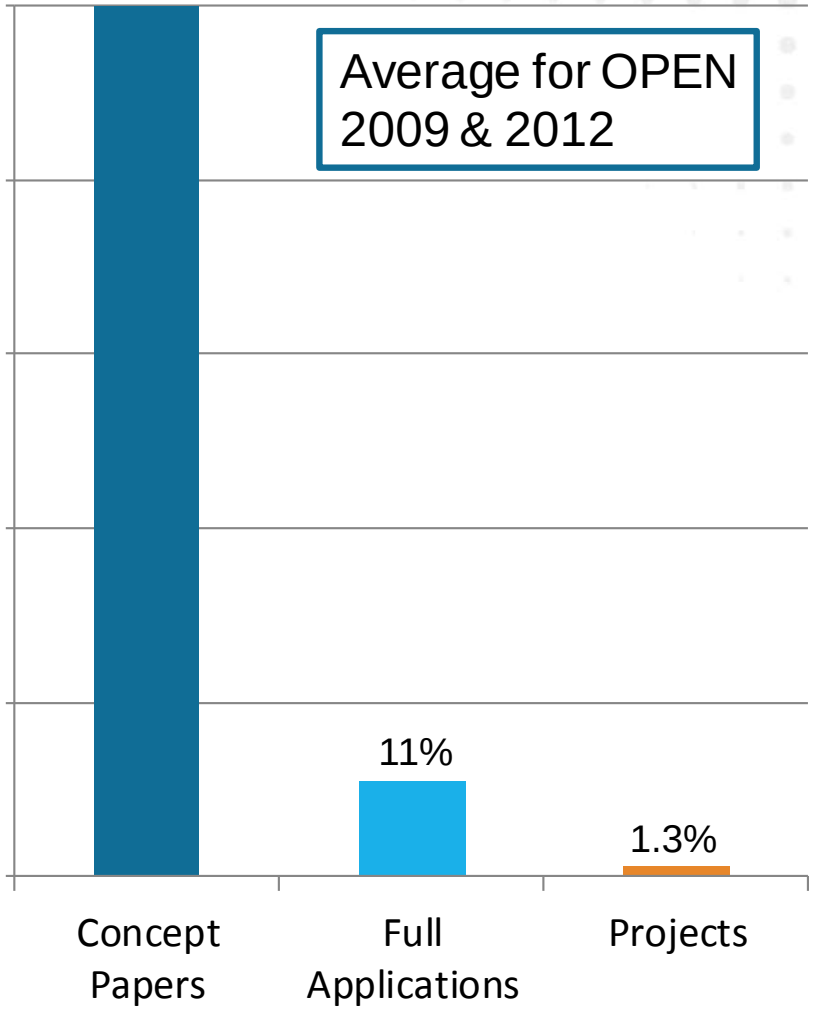
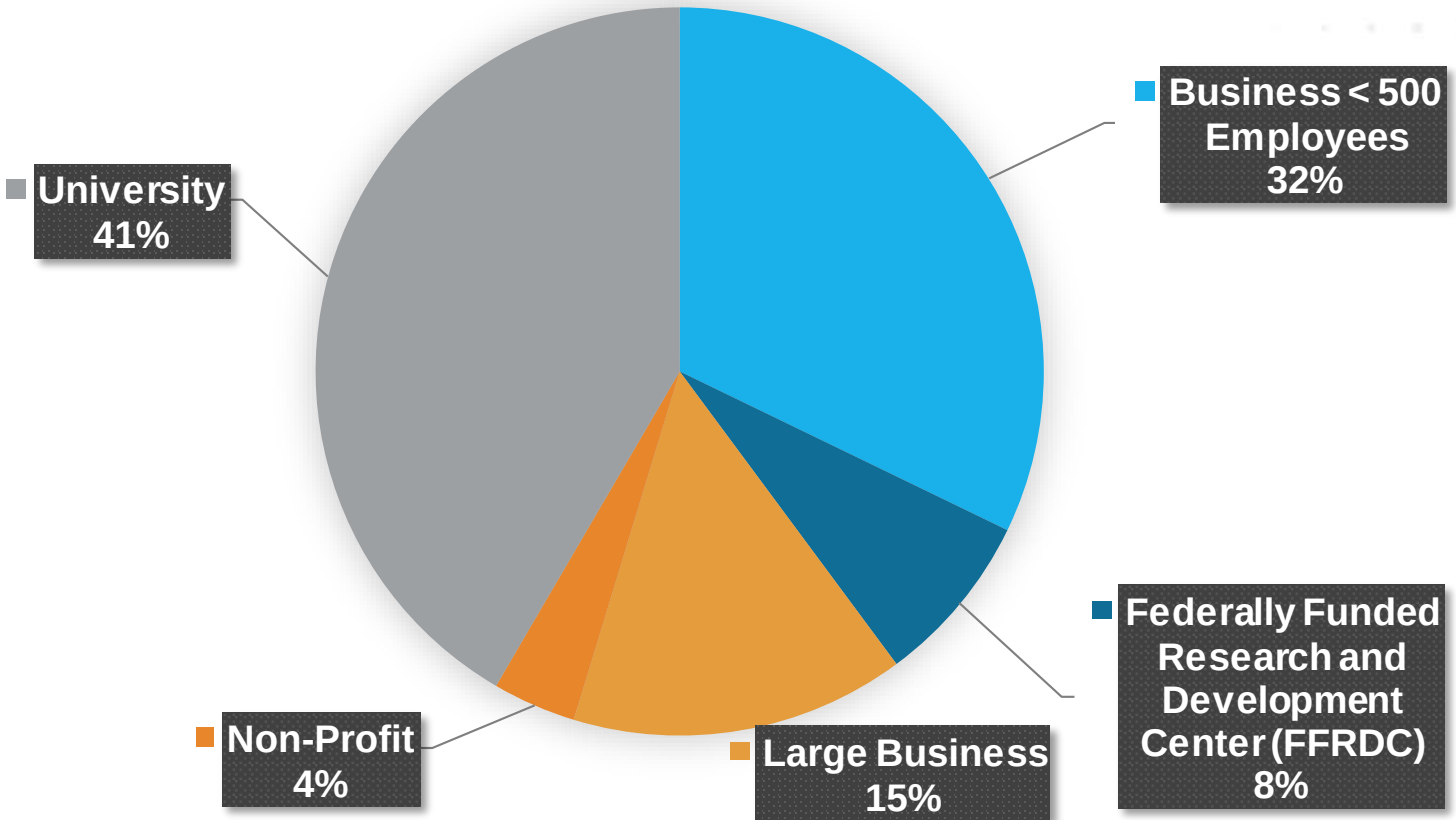
FOA Success Rates





ARPA-E Project Portfolio by Lead Organization

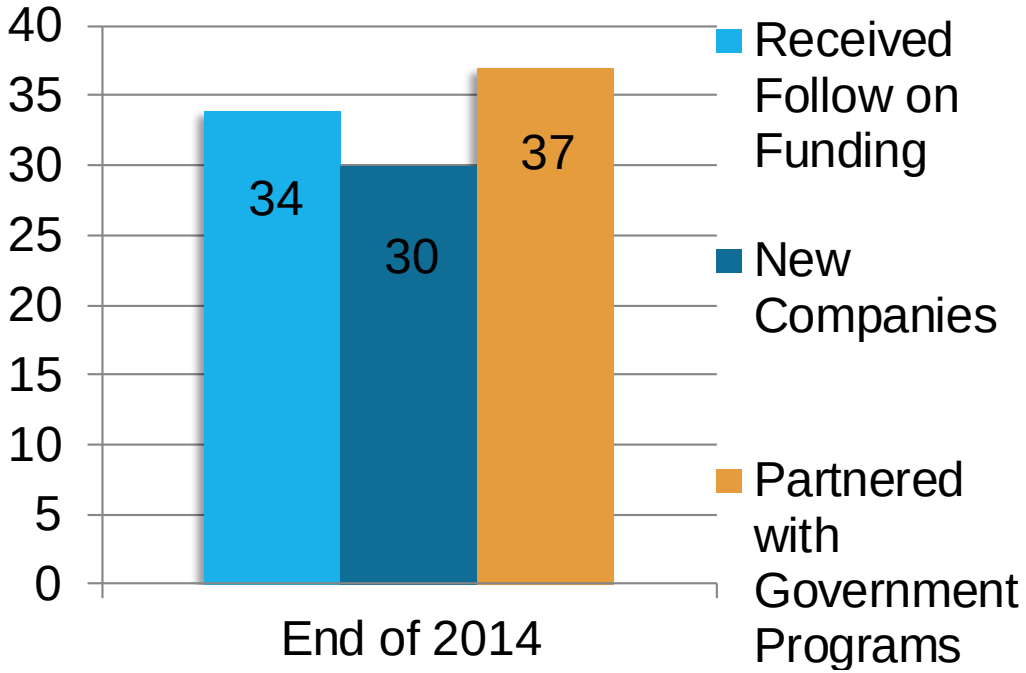


ARPA-E supports multi-institutional teams with substantial involvement from the private sector:
74% of projects involve more than one institution
79% of projects include the private sector, as leads or partners

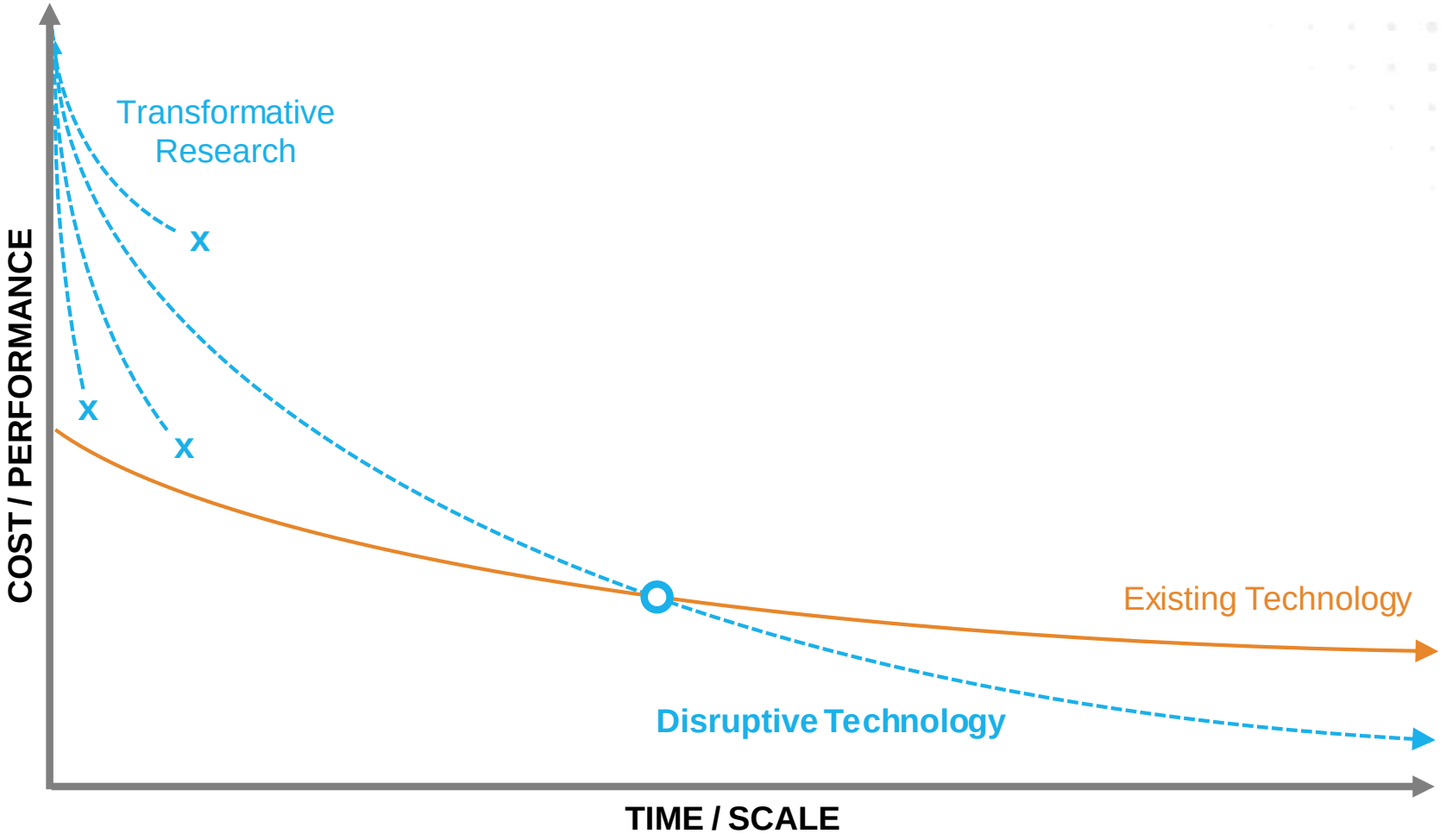
Measuring the transition to the market

Since 2009 ARPA-E has invested approximately $1.1 billion in more than 400 projects through 23 focused programs and two OPEN solicitations.

34 ARPA-E projects have attracted more than $850 million in private-sector follow-on funding.



Transformative R&D to disruptive technology



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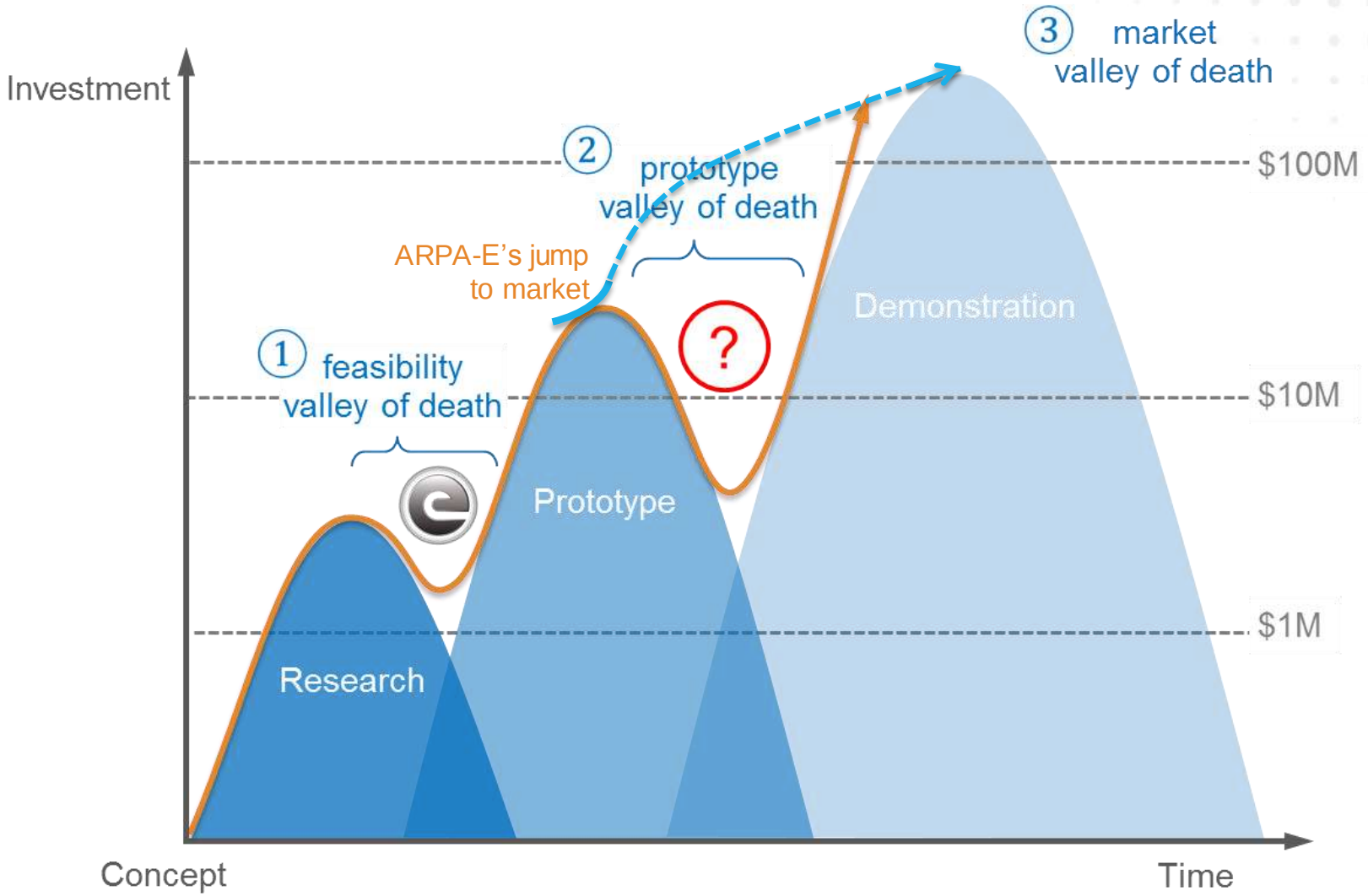
Energy Technology "Valleys of Death"



What Makes an ARPA-E Project?

IMPACT

- High impact on ARPA-E mission areas
- Credible path to market
- Large commercial application

TRANSFORM

- Challenges what is possible
- Disrupts existing learning curves
- Leaps beyond today's technologies

BRIDGE

- Translates science into breakthrough technology
- Not researched or funded elsewhere
- Catalyzes new interest and investment

TEAM

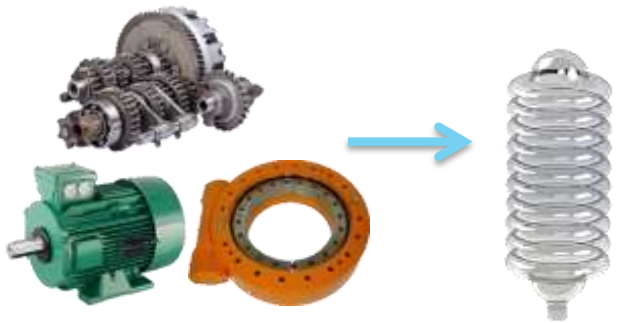
- Comprised of best-in-class people
- Cross-disciplinary skill sets
- Translation oriented

Pneumatic solar tracking

sunfolding

What's old:

- Electric Motors
- Gears
- Rigid structures
- Top down controls



What's New:

- Pneumatics
- Plastics
- Compliant structures
- Distributed actuation

- High strength plastics provide the same strength as steel for 1/3 the cost

ARPA-E Impact

INNOVATION OPPORTUNITIES

PATH TO COMMERCIALIZATION

EVOLVING PORTFOLIO

OPTIONS FOR THE FUTURE

Program Directors

ARPA-E is continually recruiting new Program Directors, who serve 3-year terms

ROLES & RESPONSIBILITIES

Program development

- Perform technical deep dive soliciting input from multiple stakeholders in the R&D community
- Present & defend program concept in climate of constructive criticism

Active project management

- Actively manage portfolio projects from merit reviews through project completion
- Extensive “hands-on” work with awardees

Thought leadership

- Represent ARPA-E as a thought leader in the program area

ATTRIBUTES

- R&D experience; intellectual integrity, flexibility, and courage; technical breadth; commitment to energy; communication skills; leadership; and team management
- ***A passion to change our energy future***

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If you are interested please contact me or any ARPA-E program director

Fellows

ARPA-E also hires Fellows, who serve 2-year terms

ROLES & RESPONSIBILITIES

Identification of high-impact energy technologies

- Perform technical and economic analyses to identify high-impact energy technologies.
- Publish original research papers and reviews.

Program director support

- Help develop future programs through technical analysis, discussions, and workshops.
- Assist with management of current projects, including site visits.

Organizational support

- Review proposals for funding opportunities.
- Contribute to the strategic direction and vision of the agency.

ATTRIBUTES

- Ph.D. in science or engineering; strong analytical and communication skills; ability to work independently and across disciplines; leadership.
- ***A passion to change our energy future***

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If you or one of your students are interested please contact me, an ARPA-E program director, or a Fellow

Sign up for our newsletter at
www.arpa-e.energy.gov

Join us at our 2016 Summit

February 29 – March 2 2016
Gaylord National Convention Center
just outside Washington, DC.